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ABSTRACT

Teachers rely on mental planning throughout the design, implementation, and evaluation phases of instruction. This paper focuses on the elementary school teacher's use of instructional design (ID) skills in the planning and delivery of instruction, emphasizing the relative and "real" use of ID practices in both mental and written planning. Two studies of elementary school teachers, one involving 22 teachers from schools across North Carolina, the other involving 17 teachers from Provo School District in Utah, addressed planning issues and practices by yearly, unit, and daily planning. Results of both studies, illustrated in 12 data tables, indicated: (1) teachers favored mental planning; (2) plans were more specific at the unit and daily levels; (3) most teachers with formal training in ID felt it had improved their planning processes; (4) most teachers consciously used ID processes in planning; (5) the crucial elements of the ID process were goals, learner analysis, objectives, activities and strategies, tests, and revision; (6) ID processes received more attention at the unit and daily levels; (7) most teachers gave equal importance to written and mental planning; (8) during teaching there was less deviation from unit and daily plans than from yearly plans; (9) initial planning decisions centered around content and objectives, while most planning time was spent on content, materials, and activities; and (10) testing instruction prior to using it in the classroom was impractical. Ways for teachers and instructional designers to work together include: (1) developing a common technical language of instruction; (2) validating the scientific bases of teaching as essential precursors of the art of teaching; (3) adopting a layers-of-necessity philosophy in modifying classical ID to meet the needs and practices of teachers; and (4) recognizing the need for gradual reform and fundamental systemic restructuring as concurrent, interactive ventures. (Contains 37 references.) (Author/SWC)

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Title:

Instructional Design Fundamentals as Elements of Teacher Planning Routines: Perspectives and Practices from Two Studies

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Overview

A careful review of the teacher planning literature illustrates clearly that teachers rely on mental planning to guide what occurs in their classrooms . This mental planning, or reflective mental dialog, not only precedes written planning, but occurs throughout the design, implementation, and evaluation phases of instruction. It is a key element in planning *prior* to teaching, in reflection, monitoring, and adjustment *during* teaching, and in reflective evaluation and revision *following* teaching.

This presentation builds upon the findings (often mixed) of prior research , and, based upon the results of ongoing studies of the practices of elementary school teachers, focuses on the teacher use of ID skills in the planning and delivery of instruction. In particular it takes a close look at the relative and "real" use of ID practices in both mental and written planning.

Background

Two decades ago, Beilby's (1974) efforts to narrow the gap between teacher educators and instructional technologists focused on our need as a field to "relinquish a considerable portion of [our] ID role to teachers" (p. 12). His charge was based on our common mission "to facilitate and improve the quality of human learning" (Ely *et al*, 1972). Although this clarion call was repeated by Stolovitch (1980), very little change occurred until the decade of criticism spawned by *A Nation at Risk* (1983).

In the more inviting context of school reform, instructional designers began to display increasing interest in sharing their skills with classroom teachers. The proposed interventions covered the whole gamut of the educational process — from teacher preparation (Burkman, 1987; Earle, 1985, 1992; Klein, 1991; Martin & Clemente, 1990; Reiser & Mory, 1991; Reiser & Radford, 1990; Snelbecker, 1987) to teacher inservice (Shrock & Byrd, 1987; Schiffman, 1987) to systems redesign (Banathy, 1991; Branson, 1987; Reigeluth, 1987; Reigeluth & Garfinkle, 1992; Reiser & Salisbury, 1991; Salisbury, 1993). However, the approach to reconciliation was often one-sided, more along the lines of "what we can offer you," rather than a search for common ground — an approach which re-emphasized the fact that these two professional groups have remained separate and aloof in both research literature and instructional theories.

Although it might be reasonable to assume that researchers and theorists from two closely related fields such as teacher education and instructional design would work collaboratively to exchange ideas and concerns about the improvement of instruction, the gap between both fields has instead widened over the years. Until recently, instructional design and teacher education were viewed as separate fields. Despite an amazingly common interest (i.e., the teaching and learning process), teacher educators and instructional designers read and write separate literature and study different theoretical procedures .

Hence ID interventions for the classroom are perceived by teachers and teacher educators as low in credibility— largely because there exists little common language or understanding for communication. If we are to successfully continue our venture into school reform, then we need to understand what's happening in schools and in teacher education.

All of us who wish to contribute to schools would be well advised to read what school people read and go where school people go.This means stretching beyond our typical spheres of communication to try to understand schooling from the perspective of those who "live" there (Shrock, 1990, p. 29).

While many teacher educators view instructional design skills as important, few teacher education programs offer courses that would provide opportunities for students to develop instructional design skills. Since it is unlikely that the public schools will employ many instructional designers, and it *is* likely that teachers in public schools will pay more attention to design principles, teacher education programs are challenged to develop strategies to bridge the gap between the theory of instructional design and the practice of teaching.

Recent efforts by several instructional designers, in providing focused observations on what teachers do in their classrooms and how we can best mesh our expertise with theirs, have generated the following insights:

- systems approach principles can be taught to preservice teachers
- differences exist between Id models and teacher models of thinking and learning
- teachers implicitly apply ID practices when planning to teach
- teachers think and talk about instructional planning in different ways

Reiser (1994) reflected upon three years of research into the use of ID skills in teacher planning, sharing his overall impressions as well as suggestions for future research. He indicated that systems approach principles can be taught to preservice teachers quite successfully but that additional instruction and skill applications were necessary to ensure effective and continued use of ID skills by teachers. Moallem (1994) explored an expert teacher's model of thinking and teaching within the context of the social context of the classroom. This ethnographic study, which compared teacher thinking to instructional design, suggested fundamental differences between these two models. Kennedy (1994), in order to determine whether teachers use ID or personal heuristics, reviewed four Canadian studies of ID knowledge, competency, and use. She concluded that teachers have an abysmal understanding of learning theory as an underlying framework for instruction. She felt that their inability to see instruction from a systems perspective was ample evidence of the need for ID skills in preservice training.

Branch (1994) introduced his study of secondary teachers with a discussion of the constituent elements of an instructional episode and the fundamental components of ID. In particular, he stressed the need to translate ID jargon into teacher language, and indicated that teachers implicitly apply ID practices when planning to teach. Driscoll, Klein, and Sherman (1994) examined how teachers and instructional designers think and talk about instructional planning. They explored the differences which exist in how both groups conceive of their practices in order to determine how such differences contribute to the lack of perceived impact of ID in teaching contexts. Garbosky (1994) took a "then and now" approach by comparing (after six years) the activities, experience, and feelings of educators formally trained in instructional design. Her article illustrated quite well the reality and the breadth of the gap between the two fields.

There is no question that teachers design instruction, even if they do not follow classical ID principles, and even if they don't consider what they do to be instructional design (Clark & Angert, 1980). Zahorik (1975) classified teacher decisions in the design process into eight categories: objectives, content, activities, materials, diagnosis, evaluation, instruction, and organization. Note the similarities between these categories of design decisions and the common elements of ID models compiled by Andrews and Goodson (1980). In addition to these categories, the teacher planning literature has attended to the time frames of planning and the products or processes of planning (McCutcheon, 1980; Clark & Yinger, 1979; Morine-Dershimer, 1978-9; Peterson, Marx, & Clark, 1978; Zahorik, 1975). More recent research has emphasized the practical application of ID skills in the planning processes of teachers (Earle 1992; Reiser & Mory, 1991; Klein, 1991; Martin, 1990; Martin & Clemente, 1990). Research on teacher planning emphasizes its importance as process (Arnold, 1988; Yinger 1977) and indicates that teachers make decisions "about lesson plans, interactive teaching, modifications required during teaching, and other ways... to routinely plan and evaluate and modify instruction" (Snelbecker, 1987, p. 35).

Bridging the Gap: Two Studies

Do teachers typically employ instructional design practices when they are planning their instruction? If so, what practices do they employ? If not, why don't they employ them? Are the planning practices of those pre-service and in-service teachers who have been taught basic instructional design principles different from the practices ot those who have not been taught these principles?

The first study involved twenty-two elementary teachers from schools across North Carolina (NC) The second study included seventeen elementary teacher from Provo School District in Utah (UT). Both groups responded to a detailed survey which covered demographics, general information, and practices in yearly, unit, and daily planning. Similar questions addressed each level of planning. Follow-up interviews which delved further into planning issues were held with teachers selected from each group.

Patterns of Practice

The results of both studies with elementary school teachers indicate the following trends or patterns in their planning and delivery practices:

- Teachers favored mental planningwhile recognizing the importance of written planning, particularly at the unit level. Production of written plans was closely related to administrative requirements.
- Plans tended to be more specific at the unit and daily levels in all areas (content, materials, activities, objectives, and tests) and more general at the yearly level (see Table 11).
- Most teachers who have had formal training in instructional design felt that a knowledge of ID had improved their planning processes (NC 81% ; UT 90%).
- Most teachers consciously used ID processes in their planning (NC 60% ; UT 73%).
- The crucial elements of the ID process were goals, learner analysis, objectives, activities and strategies, tests, and revision (see Table 4). These aspects were also considered formally (see Table 1) and were more likely to be included in written plans (see Table 2). Note the mixed results with learner analysis. Task analysis, types of learning, instructional plans, and try-out were considered helpful but tended to be addressed informally and mentally.
- ID processes received more attention at the unit and daily levels of planning rather than at the yearly level (see Table 3).
- Most teachers gave equal importance to written and mental planning (see Table 5).
- During teaching, there was less deviation from unit and daily plans (both of which were considered more important) than from yearly plans (see Tables 6 and 7).
- Initial planning decisions centered around content and objectives at all levels (see Table 10) while most planning time focused on content, materials, and activities (see Table 9).
- Trying out the instruction prior to using it in the classroom was impractical for elementary teachers. They relied on mental imagery and planning to test the instruction prior to delivery. Afterwards, reflection allowed for revision.

Moving Ahead[1]

Instructional designers offer teachers a vast array of expertise in the improvement of instruction and learning. However, since teachers and technologists often view both teaching and technology differently, emphasis must be placed on closing the gap, on developing productive ways of working togerher. "In order to make any real headway as a field, we will have to come to some reconciliation of our differences if we want our diffusion efforts in teacher education to pay off" (Martin, 1990, p. 56).

However the pay-off will depend on our performance. In an analysis of the techniques of Coach "Bear" Bryant in building a winning team at the University of Alabama, Gilbert and Bilbert (1988) report:

> Two -thirds of all fourth grade kids who sign up voluntarily to learn to play woodwind instruments quit within 60 days. The reason? No indication of any likelihood of success... when it comes to motivation, phony displays of warmth are no substitute for evidence of successful performance (p. 34).

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[1]These ideas were first expressed in Earle, R.S. (1994). Instructional design and the classroom teacher: Looking back and moving ahead. *Educational Technology*, 34 (3), 6-10.

May I suggest, then, that as we move ahead to where we, as instructional designers, should be in our relationship with classroom teachers and the public schools we base our performance on the following guidelines derived from looking back at where we've been.

- Develop a common technical language of instruction based on an integration of the literature from both fields.
- Validate the scientific bases of teaching as essential precursors of the art of teaching.
- Adopt a layers-of-necessity philosophy in modifying classical ID to meet the needs and practices of teachers.
- Recognize the need for piece-meal reform and fundamental systemic restructuring as concurrent, interactive ventures.

An examination of the mental planning processes of teachers necessarily brings us face to face with the multifaceted, dynamic, complex nature of the teaching. Though the process is often perplexing, we have an opportunity to savor the adventure of taking a look into the world of the classroom teacher. As we strive to blend the research and theories of teacher education and instructional design, perhaps a deeper recognition of the richness of teacher planning practices will provide avenues for the modified implementation of ID strategies and techniques to enhance the quality of human learning.

Table 1: Formal and Informal Use of ID Processes (%)

	Formal		Informal	
	NC	UT	NC	UT
Develop or review course and unit *goals*	43	*63*	48	*50*
Develop a *task analysis* or learning hierarchy to identify prerequisite skills and sequence of instruction	24	*25*	67	*68*
Classify *types of learning* indicated in the content	14	*12*	76	*88*
Analyze the abilities and need of *learners*	71	*25*	24	*88*
Develop performance or behavioral *objectives*	62	*50*	38	*56*
Develop *tests* that match the learnings described in the objectives	62	*69*	33	*38*
Select or produce learning *activities and strategies* that match the type of learning and objective	76	*69*	29	*31*
Follow a systematic *instructional plan* (e.g., Gagne's events of instruction or Madeline Hunter's steps, etc.)	62	*31*	43	*63*
Try out the instruction prior to using it in the classroom	14	*0*	71	*81*
Revise the instruction based on the results observed during teaching	52	*56*	57	*69*

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Table 2: Written or Mental Plans (%)

	Written		Mental	
	NC	UT	NC	UT
Goals	62	*88*	62	*63*
Task Analysis	29	*63*	76	*69*
Types of Learning	14	*6*	90	*88*
Learner Analysis	43	*31*	86	*88*
Objectives	86	*75*	33	*38*
Tests	86	*81*	52	*50*
Activities & Strategies	86	*63*	52	*56*
Instructional Plan	52	*69*	62	*81*
Try Out	19	*0*	86	*81*
Revise	76	*50*	71	*81*

Table 3: Use of ID Processes in Yearly, Unit, and Daily Planning (%)

	Year		Unit		Day	
	NC	UT	NC	UT	NC	UT
Goals	50	*63*	70	*81*	30	*25*
Task Analysis	30	*38*	45	*69*	25	*38*
Types of Learning	10	*25*	25	*63*	35	*31*
Learner Analysis	30	*44*	50	*50*	65	*75*
Objectives	40	*38*	45	*81*	45	*63*
Tests	10	*13*	55	*88*	35	*50*
Activities & Strategies	20	*13*	55	*88*	70	*69*
Instructional Plan	10	*13*	35	*56*	70	*69*
Try Out	10	*6*	20	*19*	25	*44*
Revise	30	*6*	55	*69*	75	*81*

Table 4: The Value of ID Processes (%)

	Year		Unit		Day	
	NC	UT	NC	UT	NC	UT
Goals	67	*88*	33	*12*	0	*0*
Task Analysis	25	*25*	67	*75*	8	*0*
Types of Learning	17	*12*	50	*88*	33	*0*
Learner Analysis	92	*88*	8	*12*	0	*0*
Objectives	83	*5*	0	*25*	17	*0*
Tests	75	*69*	17	*31*	8	*0*
Activities & Strategies	83	*69*	17	*31*	0	*0*
Instructional Plan	17	*19*	75	*69*	8	*12*
Try Out	0	*0*	75	*75*	25	*25*
Revise	67	*63*	33	*37*	0	*0*

Table 5: Importance of Written and Mental Plans (%)

	Written		Mental		Equal	
	NC	UT	NC	UT	NC	UT
Overall	25	*6*	37.5	*19*	37.5	*75*
Year	31	*53*	31	*7*	38	*40*
Unit	29	*19*	7	*12*	64	*69*
Daily	33	*0*	27	*31*	40	*69*

Table 6: Following Plans (%)

	Year		Unit		Daily	
	NC	UT	NC	UT	NC	UT
Very Closely	8	*7*	8	*6*	13	*20*
Closely (< 25% deviation)	46	*33*	77	*69*	67	*67*
Somewhat Closely (25-49% deviation)	31	*60*	15	*25*	20	*7*
Somewhat Loosely (50-75% deviation)	15	*0*	0	*0*	0	*6*
Very Loosely (> 75% deviation)	0	*0*	0	*0*	0	*0*

Table 7: Importance of Planning (%)

	Year		Unit		Daily	
	NC	UT	NC	UT	NC	UT
Crucial (100% of the time)	23	*20*	31	*38*	60	*33*
Useful (75% of the time)	46	*60*	69	*62*	40	*67*
Generally Useful (50% of the time)	31	*13*	0	*0*	0	*0*
Minimally Useful (25% of the time)	0	*7*	0	*0*	0	*0*
Not Very Useful (<10% of the time)	0	*0*	0	*0*	0	*0*

Table 8: Amount of Written Planning (%)

	Overall		Yearly		Unit		Daily	
	NC	UT	NC	UT	NC	UT	NC	UT
More than 75%	29	*19*	33	*44*	33	*19*	27	*19*
50%-74%	18	*31*	20	*12*	33	*44*	20	*12*
25%-49%	35	*25*	27	*19*	27	*25*	33	*50*
Less than 25%	18	*25*	20	*25*	7	*12*	20	*19*

Table 9: Percentages of Planning Time (Mean %)

	Yearly		Unit		Daily	
	NC	UT	NC	UT	NC	UT
Content	26	*32*	22	*21*	18	*23*
Materials	17	*20*	19	*22*	24	*28*
Activities	23	*20*	27	*27*	28	*25*
Objectives	24	*17*	20	*15*	20	*13*
Tests	7	*9*	10	*12*	9	*10*

Table 10: First Decisions (%)

	Yearly		Unit		Daily	
	NC	UT	NC	UT	NC	UT
Content	43	*64*	29	*71*	14	*29*
Materials	5	*0*	5	*0*	5	*7*
Activities	5	*0*	0	*0*	14	*14*
Objectives	48	*36*	62	*29*	67	*50*
Tests	0	*0*	0	*0*	5	*0*

Table 11: Specificity of Plans (%): NC

	Very Specific			Somewhat Specific			Somewhat General			Very General		
	Y	U	D	Y	U	D	Y	U	D	Y	U	D
Content	30	44	37	15	44	47	35	11	11	20	0	0
Materials	20	44	32	25	39	47	30	11	16	20	6	5
Activities	15	33	37	15	56	42	45	17	21	20	0	0
Objectives	40	61	47	40	33	47	10	6	0	10	0	11
Tests	10	22	32	20	39	32	10	17	0	35	17	20

Table 12: Specificity of Plans (%): UT

	Very Specific			Somewhat Specific			Somewhat General			Very General		
	Y	U	D	Y	U	D	Y	U	D	Y	U	D
Content	20	50	38	27	38	56	40	12	6	13	0	0
Materials	20	38	56	40	62	38	33	0	6	7	0	0
Activities	13	31	38	47	63	56	20	6	6	20	0	0
Objectives	53	69	60	20	25	27	7	6	13	20	0	0
Tests	27	38	53	20	56	33	33	6	13	20	0	0

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